

Remarks

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Thus, each of claims 1 and 12, which are the only independent claims in the application, has been amended to recite that the porous membrane has a tensile strength of at least 5 MPa, which is based on the disclosure at page 12, line 16 of the specification.

The patentability of the presently claimed invention after entry of the foregoing amendments, over the disclosures of the references relied upon by the Examiner in rejecting the claims, will be apparent upon consideration of the following remarks.

Thus, the rejection of claims 1, 2, 4 and 9 under 35 U.S.C. §102(b) as being anticipated by Meguro et al. (US '136), as well as the rejection of claims 1 and 5 under 35 U.S.C. §102(b) as being anticipated by Kashio et al. (US '637), are respectfully traversed.

As Applicants have previously argued, the rejections are based on the premise that these references disclose a vinylidene fluoride copolymer as a separator, which is a porous membrane, for lithium ion batteries. This is not true. Both Meguro et al. and Kashio et al. disclose a hydrophilized vinylidene fluoride polymers including a copolymer of vinylidene fluoride with a hydrophilic monomer (as used in the present invention), used as an **electrode binder** for electric double layer capacitors or lithium ion batteries **for enhancing the adhesion with electroconductive substrates** (Meguro et al., column 3, lines 24-31; Kashio et al., column 3, lines 50-67).

Furthermore, the electrode binder of the Meguro et al. and Kashio et al. references includes the hydrophilized vinylidene copolymer in admixture with a large amount of powdery electrode material, and it is clear to one of ordinary skill in the art that a mixture of a vinylidene fluoride copolymer with a large amount (more than 5 wt. parts (col. 5, lines 13 - 15 of Meguro et al.) or more than 2 wt. parts (col. 7, lines 24 - 26 of Kashio et al.) per 1 wt. part of the vinylidene fluoride copolymer) of powdery electrode material, provides a layer (or membrane) having a substantially lower tensile strength than a membrane consisting essentially of the vinylidene fluoride copolymer as claimed in the present application.

In this regard, in item 12 beginning on page 11 of the current Office Action, in responding to Applicants' previous patentability arguments, the Examiner takes the position that to overcome the rejection set forth with the feature "consisting essentially of", Applicants are

required to submit experimental data to show that the ingredients other than the components being claimed in fact can affect the properties of the vinylidene fluoride resin being claimed.

In response to this argument, Applicants are submitting herewith a Declaration Under 37 CFR 1.132 by one of the present inventors, describing experimental tests which demonstrate that the carbon materials essentially required by Meguro et al. and Kashio et al. in addition to the vinylidene fluoride copolymer claimed in the instant application do, in fact, affect the properties of the claimed porous membrane of vinylidene fluoride resin. Particularly, the experimental results clearly show that a large amount of such carbon materials substantially reduces the strength or tenacity and shape-retaining integrity essentially required of a porous membrane for water treatment or a separator for batteries, for which the porous membrane of the instant application is intended to be used (page 2, lines 7 - 17 and page 1, line 12 - 15 of the present specification).

In connection with this showing, Applicants have now amended claims 1 and 12 to recite that the porous membrane has a tensile strength of at least 5 MPa. In view of these amendments, combined with the showing set forth in the attached Declaration, it is apparent that the presently claimed invention is not anticipated by either of the Meguro et al. or Kashio et al. references.

The rejection of claim 8 under 35 U.S.C. §102(b) or 35 U.S.C. §103(a) based on the Meguro et al. reference, as well as the rejection of claims 8-9 under 35 U.S.C. §102(b) or 35 U.S.C. §103(a) based on the Kashio et al. reference, are respectfully traversed.

Claims 8-9 are dependent on claim 1, which is not anticipated by Meguro et al. or Kashio et al. for the reasons set forth above. Furthermore, there would be no motivation for one of ordinary skill in the art to eliminate the large amount of powdery electrode material from the electrode binder of these references, and therefore the subject matter of claims 8-9 is not obvious from the references.

The rejection of claims 10-12 under 35 U.S.C. §103(a) as being unpatentable over Meguro et al. in view of Takamura et al. (US '773), as well as the rejection of claims 10-12 under 35 U.S.C. §103(a) as being unpatentable over Kashio et al. in view of Takamura et al., are respectfully traversed.

The comments set forth above concerning the Meguro et al. and Kashio et al. references are equally applicable to this rejection.

Takamura et al. disclose a process for producing a hollow fiber porous membrane of vinylidene fluoride polymer, but fail to disclose a vinylidene fluoride polymer hydrophilized through copolymerization. Accordingly, Takamura et al. fail to disclose the effects of improving the soiling resistance and water permeability owing to the use of a hydrophilic vinylidene fluoride copolymer in the present invention.

The rejection of claims 3, 6 and 7 under 35 U.S.C. §103(a) as being unpatentable over Meguro et al. in view of Muller et al. (US '401) is respectfully traversed.

The comments set forth above concerning the Meguro et al. reference are equally applicable to this rejection.

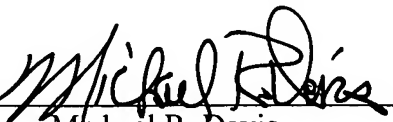
Muller et al. disclose a vinylidene fluoride polymer grafted with a hydrophilic polymer, which is however essentially different from a hydrophilic vinylidene fluoride copolymer obtained through copolymerization (monomer-to-monomer reaction) of vinylidene fluoride monomer and a hydrophilic monomer, as discussed in Applicant's response filed March 30, 2009.

For these reasons, the presently claimed invention is neither anticipated nor suggested by either of the Meguro et al. and Kashio et al. references, nor are any of the present claims directed to subject matter which is obvious from a combination of either of these references with Takamura et al. or Muller et al.

Therefore, in view of the foregoing amendments and remarks, together with the attached Rule 132 Declaration, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

Takumi KATSURAO et al.

By 

Michael R. Davis

Registration No. 25,134

Attorney for Applicants

MRD/pth
Washington, D.C. 20005-1503
Telephone (202) 721-8200
Facsimile (202) 721-8250
June 7, 2010